REMARKS

Claims 2-8, 19-24, and 31-39 are pending in the application, claims 32-39 having been added by the above amendment. Claims 3-8 and 20 have been amended. Support for the amendments and new claims can be found in the specification at, e.g., page 5, line 24, to page 6, line 16; page 11, line 19, to page 12, line 4; and page 31, line 27, to page 32, line 1. No new matter has been added by these amendments.

35 U.S.C. § 112, 1st Paragraph (Written Description)

Claim 5 was rejected as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner stated (at page 3 of the Office Action) that

> [c]laim 5 recites a nucleotide sequence that is identical to a segment comprising at least 25% of the contiguous nucleotide bases set forth in SEQ ID NO:7. The specification and claim do not indicate what distinguishing attributes are shared by the members of the genus. Thus, the scope of the claims includes numerous structural variants, and the genus is highly variant because a significant number of structural differences between genus members is permitted. Since the disclosure fails to describe the common attributes or characteristics that identify members of the genus, and because the genus is highly variant, SEQ ID NO: 7 alone is insufficient to describe the genus. One of skill in the art would reasonably conclude that the disclosure fails to provide a representative number of species to describe the genus. Thus, applicant was not in possession of the claimed genus.

Applicants disagree. Nevertheless, in the interest of advancing prosecution, claim 5 has been amended to depend from claim 4. In view of that amendment, the rejection should be withdrawn. More specifically, claim 4 covers a nucleic acid containing at least 24 nucleotides that hybridizes to a reference sequence under specific hybridization and washing conditions. Claim 5 further limits claim 4 by requiring that the nucleic acid contain a nucleotide sequence that is identical to a segment containing at least 25% of contiguous nucleotide bases of SEQ ID NO:5 from nucleotides 15-1649, SEQ ID NO:7 from nucleotides 15-1652, or a complement thereof. Accordingly, amended claim 5 requires that nucleic acids encompassed by the claim have both a specific structural component (a defined segment of the coding region of SEQ ID

NO:5, SEQ ID NO:7, or the complement thereof) as well as the ability to hybridize to a specific reference sequence. A person of ordinary skill in the art would clearly understand the structural definition of the nucleic acid provided by the claim and would therefore understand applicants to have been in possession of the claimed nucleic acid at the time the application was filed. Accordingly, amended claim 5 satisfies the written description requirement. Applicants request that the Examiner withdraw the rejection.

35 U.S.C. § 112, 2nd Paragraph

Claims 4, 19-24, and 31 were rejected as allegedly indefinite in their recitation of the phrase "high stringency." According to the Examiner, "[w]ithout a clear definition as to what level of hybridization is intended by the applicant, one of skill in the art would be unable to replicate the claim."

Claim 4 has been amended to recite the specific conditions of hybridization and washing described in the application at page 31, line 27, to page 32, line 1. These specific conditions clearly define the metes and bounds of the claimed nucleic acid. Accordingly, applicants request that the Examiner withdraw the rejection of claim 4 and the claims that depend therefrom.

35 U.S.C. § 103(a)

Claims 2, 9, 10, 19-24, and 31 were rejected as allegedly obvious over Srivastava *et al.* (WO 95/24923), in view of Hamel *et al.* (WO 96/40928) and Suzue and Young (in *Stress-Inducible Cellular Responses*, Feige *et al.* (Eds), Birkhauser Verlag, 1996, pp. 449-463). The Examiner stated (at page 5 of the Office Action) that

> [g]iven that 1) Srivasta (sic) et al. has taught of isolating Hsp60 polypeptides in pathogenic organisms and expressing the polypeptides in a suitable vector and that 2) Hamel et al. has taught of isolating the nucleotide sequences encoding Streptococcus heat shock proteins and that 3) Suzue et al. has taught that heat shock proteins when used as a subunit vaccine, stimulate protective immunity in animal models it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to isolate nucleic acid molecules encoding heat shock proteins (i.e. Hsp60, Hsp70, Hsp90) in *Streptococcus*.

Applicants respectfully traverse the rejection.

Independent claim 2 reads as follows: an isolated nucleic acid molecule encoding a *Streptococcus pyogenes* Hsp60. The present rejection of claim 2 and the claims that depend therefrom is generally based on the Examiner's assertions that the prior art: (1) disclosed methods of isolating nucleic acids encoding heat shock proteins; and (2) described the use of heat shock proteins as vaccines. This is not sufficient. There can be no *prima facie* case of obviousness where a prior art reference (or references when combined) fails to teach or suggest all the limitations of a claim (see, e.g., MPEP § 2142).

As stated by the Federal Circuit in *In re Deuel*, 51 F.3d 1552 (Fed. Cir. 1995), a leading case on the application of obviousness standards to nucleic acid composition claims, "[a] general incentive does not make obvious a particular result, nor does the existence of techniques by which those efforts can be carried out." *Deuel* at 1559. In *Deuel*, the Federal Circuit emphasized that "[t]he PTO's focus on known methods for potentially isolating the claimed DNA molecule is also misplaced because the claims at issue define compounds, not methods." *Deuel* at 1559. A *prima facie* case of unpatentability of a nucleic acid composition requires that the teachings of the prior art suggest the claimed composition to a person of ordinary skill in the art. *Deuel* at 1557.

Here, the Examiner has cited neither a prior art compound nor a prior art teaching that would have suggested to one of ordinary skill in the art to make specific molecular modifications necessary to result in the claimed composition. As in *Deuel*, the present rejection is based on the alleged obviousness of methods of making the claimed molecules. Because claim 2 is directed to a composition, the issue is the obviousness of the composition, not of the methods by which it is made. *In re Bell*, 991 F.2d 781, 785; *Deuel* at 1559.

Because nothing in the cited art suggests the nucleic acid composition of claim 2, applicants respectfully request that the Examiner withdraw the rejection of claim 2 and the claims that depend therefrom.

CONCLUSIONS

Applicants submit that all grounds for rejection have been overcome, and that all claims are now in condition for allowance, which action is requested.

Attached is a marked-up version of the changes being made by the current amendment. The attached page is captioned "Version with Markings to Show Changes Made." Also attached is a listing of the claims pending in the application upon entry of the above amendment. The attached pages are captioned "Pending Claims."

Enclosed is a Request for a Continued Examination (RCE) transmittal letter, a Petition for Three Month Extension of Time, and a check for the RCE fee and the Petition for Extension of Time fee. Please apply any other charges or credits to Deposit Account No. 06-1050, referencing Attorney Docket No. 12071-014001.

Respectfully submitted,

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Version with Markings t Show Changes Made

In the Claims:

Claims 3-8 and 20 have been amended as follows.

3. (Twice Amended) An isolated nucleic acid [nucleotide] molecule selected from the group consisting of:

[(a) an isolated nucleic acid molecule comprising the sequence of SEQ ID NO: 1 from nucleotides 15-1652;

(b) an isolated nucleic acid molecule comprising the sequence of SEQ ID NO: 3 from nucleotides 15-1640;]

(a) [(c)] an isolated nucleic acid molecule comprising the sequence of SEQ ID NO: 5 from nucleotides 15-1649;

(b) [(d)] an isolated nucleic acid molecule comprising the sequence of SEQ ID NO: 7 from nucleotides 15-1652; and

(c) [(e)] an isolated nucleic acid molecule comprising a sequence complementary to the sequence of SEQ ID NO:5 from nucleotides 15-1649 or complementary to the sequence of SEQ ID NO:7 from nucleotides 15-1652 [any one of the nucleotides of SEQ ID NOS: 1, 3,5 or 7 set forth in (a) through (d), respectively].

4. (Twice Amended) An isolated nucleic acid molecule comprising at least 24 nucleotides that [specifically] hybridizes to [the nucleic acid molecule of any one of SEQ ID NO: 1 from nucleotides 15-1652, SEQ ID NO: 3 from nucleotides 15-1 640,] SEQ ID NO: 5 from nucleotides 15-1649, [or] SEQ ID NO: 7 from nucleotides 15-1652, [or] a complement of SEQ ID NO: 5 from nucleotides 15-1649, or a complement SEQ ID NO: 7 from nucleotides 15-1652 when hybridization is carried out at 65°C in 6x SSC, 1x Denhardt's solution, and 0.1% SDS, and washing at 65°C in 0.2x SSC, 1x Denhardt's solution, and 0.1% SDS [thereof under conditions of high stringency].

5. (Amended) The [An isolated] nucleic acid molecule of claim 4, wherein the nucleic acid molecule comprises [comprising] a nucleotide sequence that is identical to a segment comprising at least 25% of contiguous nucleotide bases of [any one of SEQ ID NO: 1 from nucleotides 15-1652, SEQ ID NO: 3 from nucleotides 15-1640,] SEQ ID NO: 5 from nucleotides 15-1649, [or] SEQ ID NO: 7 from nucleotides 15-1652, a complement of SEQ ID NO: 5 from nucleotides 15-1649, or a complement SEQ ID NO: 7 from nucleotides 15-1652 [or a complement thereof].

6. (Amended) An isolated nucleic acid molecule [encoding Hsp60] comprising a nucleic acid sequence that encodes a polypeptide comprising a sequence that is at least 95% homologous to SEQ ID NO:6 or SEQ ID NO:8 [any one of SEQ ID NOS: 2, 4, 6 or 8 or a variant Hsp60 that is at least 95% homologous to a polypeptide according to any one of SEQ ID NOS: 2, 4, 6 or 8].

7. (Amended) The [An] isolated nucleic acid molecule of [according to] claim 3, encoding a polypeptide that is [able to be] selectively bound by an antibody specific for a [*Streptococcus pneumoniae* Hsp60 or a] *Streptococcus pyogenes* Hsp60.

8. (Amended) An isolated nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide comprising a Streptococcal Hsp60 peptide consisting of at least 8 contiguous amino acids [of a Streptococcal Hsp60 polypeptide] selected from [amino acid residues 1-545 of SEQ ID NO: 2, amino acid residues 1-541 of SEQ ID NO: 4,] amino acid residues 1-544 of SEQ ID NO: 6[,] and amino acid residues 1-545 of SEQ ID NO: 8, wherein the [encoded] Streptococcal Hsp60 peptide binds [polypeptide is able to bind] to a major histocompatibility complex molecule.

20. (Amended) The vector of [according to] claim 19, wherein the vector is an expression vector comprising a promoter operatively linked to [in operative linkage with] the isolated nucleic acid molecule [encoding the Hsp60 or portion thereof].

Pending Claims

2. An isolated nucleic acid molecule encoding a *Streptococcus pyogenes* Hsp60.

3. An isolated nucleic acid molecule selected from the group consisting of:

(a) an isolated nucleic acid molecule comprising the sequence of SEQ ID NO: 5 from nucleotides 15-1649;

(b) an isolated nucleic acid molecule comprising the sequence of SEQ ID NO: 7 from nucleotides 15-1652; and

(c) an isolated nucleic acid molecule comprising a sequence complementary to the sequence of SEQ ID NO:5 from nucleotides 15-1649 or complementary to the sequence of SEQ ID NO:7 from nucleotides 15-1652.

4. An isolated nucleic acid molecule comprising at least 24 nucleotides that hybridizes to SEQ ID NO: 5 from nucleotides 15-1649, SEQ ID NO: 7 from nucleotides 15-1652, a complement of SEQ ID NO: 5 from nucleotides 15-1649, or a complement SEQ ID NO: 7 from nucleotides 15-1652 when hybridization is carried out at 65°C in 6x SSC, 1x Denhardt's solution, and 0.1% SDS, and washing at 65°C in 0.2x SSC, 1x Denhardt's solution, and 0.1% SDS.

5. The nucleic acid molecule of claim 4, wherein the nucleic acid molecule comprises a nucleotide sequence that is identical to a segment comprising at least 25% of contiguous nucleotide bases of SEQ ID NO: 5 from nucleotides 15-1649, SEQ ID NO: 7 from nucleotides 15-1652, a complement of SEQ ID NO: 5 from nucleotides 15-1649, or a complement SEQ ID NO: 7 from nucleotides 15-1652.

6. An isolated nucleic acid molecule comprising a nucleic acid sequence that encodes a polypeptide comprising a sequence that is at least 95% homologous to SEQ ID NO:6 or SEQ ID NO:8.

7. The isolated nucleic acid molecule of claim 3, encoding a polypeptide that is selectively bound by an antibody specific for a *Streptococcus pyogenes* Hsp60.

8. An isolated nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide comprising a Streptococcal Hsp60 peptide consisting of at least 8 contiguous amino acids selected from amino acid residues 1-544 of SEQ ID NO: 6 and amino acid residues 1-545 of SEQ ID NO: 8, wherein the Streptococcal Hsp60 peptide binds to a major histocompatibility complex molecule.

19. A vector comprising an isolated nucleic acid molecule according to any one of claims 2-8.

20. The vector of claim 19, wherein the vector is an expression vector comprising a promoter operatively linked to the isolated nucleic acid molecule

21. The vector according to claim 20, further comprising a selectable or identifiable marker.

22. The vector according claim 20 wherein the promoter is a constitutive or an inducible promoter.

23. A host cell containing a vector according to claim 19.

24. The host cell according to claim 24 wherein the host cell is selected from the group consisting of a bacterial cell, a mammalian cell, a yeast cell and an insect cell.

31. A composition comprising an isolated nucleic acid molecule of any one of claims 2-8 and a pharmaceutically acceptable carrier or diluent.

32. The nucleic acid molecule of claim 3, wherein the nucleic acid molecule comprises nucleotides 15-1649 of SEQ ID NO:5.

33. The nucleic acid molecule of claim 3, wherein the nucleic acid molecule comprises nucleotides 15-1652 of SEQ ID NO:7.

34. The nucleic acid molecule of claim 6, wherein the polypeptide comprises SEQ ID NO:6.

35. The nucleic acid molecule of claim 6, wherein the polypeptide comprises SEQ ID NO:8.

36. The nucleic acid molecule of claim 8, wherein the Streptococcal Hsp60 peptide consists of at least 8 amino acids selected from amino acid residues 1-544 of SEQ ID NO:6.

37. The nucleic acid molecule of claim 8, wherein the Streptococcal Hsp60 peptide consists of at least 8 amino acids selected from amino acid residues 1-545 of SEQ ID NO:8.

38. The nucleic acid molecule of claim 6, wherein the polypeptide comprises an amino acid sequence that is at least 97% homologous to SEQ ID NO:6 or SEQ ID NO:8.

39. The nucleic acid molecule of claim 6, wherein the polypeptide comprises an amino acid sequence that is at least 98% homologous to SEQ ID NO:6 or SEQ ID NO:8.